



CRP pollinator plantings usually run light on grasses in an effort to maximize the number of flowering forbs. Usually this disparity manifests in a seeding rate ratio of planting 3 forb seeds to every 1 grass seed, ostensibly to minimize competition from the large prairie grasses so forbs can flourish. However, we know from our remnant prairies that grasses play an incredibly important role in the tallgrass prairie ecosystem, providing essential benefits ranging from soil stabilization to weed suppression. Our remnants also tell that us a healthy, diverse prairie has a strong forb and grass component at the same time. When we don't plant enough grass, weeds will take their place. Eventually, competition from weeds can turn the best intentioned planting into a stand of vegetation that provides little to no benefit to either humans or non-humans. With the high costs of prairie seed, these grass-poor pollinator plantings might not be very cost effective at all, providing fewer benefits at higher costs compared to prairie strips that are more diverse and balanced with grass species.

This summer, with the help of Shane Ferarri and Ben Nettleton, TPC compared the quality of 2-year-old prairie strips planted with a grass-poor pollinator seed mix to a diverse and well-balanced seed mix (seeding rate of 50% grass and 50% forbs). In partnership with Monarch Joint Venture, we wanted to quantify the utility of these strips for monarch habitat, but also with an eye for cost effectiveness. In other words, what kind of seed mix gives us the best bang for our buck when trying to restore monarch habitat? We found that both mixes actually had lots of milkweed and nectar plants— each 1 acre strip hosted over 1000 milkweed plants— but the balanced, diverse seed mix had more flowering species in it overall, with fewer weeds. That higher quality then translated into more cost effective monarch habitat in a big way. The diverse and balanced seed mix cost only \$24 per thousand milkweed plants, while the pollinator mix cost about twice as much- \$46 per thousand milkweed plants. As always, we need more research to really know for sure what the best, most cost effective seed mix is for planting prairie strips with real value for monarchs. But a high diversity, well balanced prairie seed mix seems like a pretty great place to start.



The Native 'Plant Materials Gap'

Greg Houseal, Natural Selections Program Manager
- gregory.houseal@uni.edu

The Tallgrass Prairie Center has worked for nearly three decades to develop and promote commercialization of genetically appropriate foundation seed of nearly 80 native species from seed provenance zones in Iowa for prairie and wetland restorations. The commercial availability of a diverse palette of Iowa native plant materials has enhanced the overall quality and ecological integrity of prairie and wetland restorations throughout Iowa, from state and county rights-of-way to conservation practices on private lands. Through this important work, the Center has also influenced science-based and real-world policy regarding native plant material use at federal, state, and county agencies, and served as a model for similar native seed initiatives around the nation. Native species of high conservation value desirable for ecological restoration goals are still unavailable, however, and continue to elude commercialization, for a variety of reasons.

Over time there has been an attempt to mirror functional guilds proportionally to that which occurs naturally throughout the tall

grass prairie biome (Figure 1). The initial approach was to develop seed sources of dominant (matrix) tallgrass prairie species beginning with warm-season grasses and common forbs. Eventually the focus shifted to greater forb diversity, providing season-long flowering spring to fall. A few years into the effort, conscious attention was given to flushing out plant guilds, i.e. warm- vs cool-season grasses, legumes, and other forbs, and to a greater focus on wetland species, particularly sedges (*Carex*), an unassuming but dominant cool season graminoid component, and largest genera, in prairies

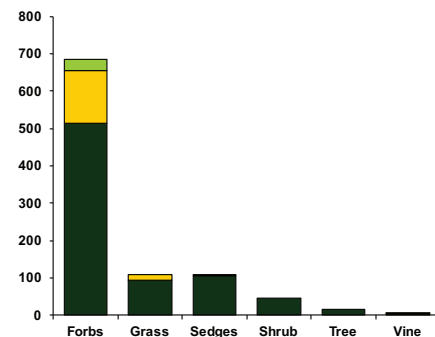


Figure 1. Number of species of greater tallgrass prairie biome by guild. Adapted from Douglas Ladd, *Tallgrass Prairie Restoration Handbook*, Packard and Mutel, 1997.

from wet to dry. The monarch decline in recent years has driven intense development, production, and marketing toward milkweeds species just in the past two years. The Center is currently growing five milkweed species identified as critical to monarch recovery by the Xerces Society. The Center has done a good job of sometimes leading and sometimes following trends, but the approach to plant materials development has been a balance of what is known about a) remnant prairie plant community composition *vis a vis* reconstructed prairies, b) seed availability, i.e. which species are already in production and certified, and c) which are amenable to agronomic production, horticultural practices, and seed cleaning technologies. Iowa Crop Improvement Association certifies 140-180 native species annually as source identified seed.

Going forward, milkweeds and other pollinator host and nectar species, including native shrubs, will continue to be important. On-going assessment of species will include a review of the limitations to commercialization, including limited market demand. Other reasons for non-availability may involve taxonomic challenges of identification, availability of initial remnant field collections of foundation material, or agronomic and horticultural challenges associated with poor germination, establishment, and seed yield. Some species may remain well beyond available methods of seed increase, and indeed, may never be cost-effective or amenable to reproduction from seed on a large scale simply because of their life-history traits.

Approaches will continue to include cooperation with stakeholder agencies

(Iowa DOT, USDA NRCS, Iowa DNR, not-for-profits, private seed producers) to compile a list of species and sources along with some indication of potential demand and scale of restoration program needs. The Center is ideally suited to explore these and to continue to develop native plant materials for Iowa's future prairie restorations.



First Source-Identified Northern Iowa Heart leaf Golden Alexander (*Zizia aptera*) production field at the Center. A perhaps lesser known, dry site-adapted cousin of Golden Alexander (*Zizia aurea*).



Prairie on Farms: Prairie strips planted on a farm in Black Hawk County

Ashley Kittle, *Prairie on Farms Program Manager*
- ashley.kittle@uni.edu

The Prairie on Farms program planted 1.85 acres of diverse prairie strips on a farm in Black Hawk County on October 24, 2016. These infield strips are in addition to the .6 acre that was planted in the fall of 2015 (2.45 total acres). The no-till producer had an erosion issue on his field. After attending a Prairie on Farms field day in 2015 the landowner decided to give prairie a try! He arranged a site visit with staff, to discuss the proper seed mix for his site (1:1 grass to wildflower ratio) and determine the proper location of the strip to work with farming equipment. The landowner was encouraged by the results he saw with the thirty-foot-wide strip and decided he wanted to do more in 2016.



Dr. Justin Meissen examines 2015 fall planted prairie strip and identifies native plants to landowner and tenant. (Picture taken October 7, 2016)

Justin Meissen and Ashley Kittle worked with the landowner to determine the appropriate location of the additional strips. The seed mix was designed specifically for his site and was mixed with a nurse crop for erosion control. An additional thirty feet was added to the 2015 contour strip. The second sixty-foot strip was planted 24 rows downhill from the original strip. The end result will be two sixty-foot infield strips of diverse prairie planted roughly on the



From the left: TPC staff Ashley Kittle and Justin Meissen, with landowner Jerry Kramer. The small Truax native seed drill works well on these prairie strips.

contour.

According to the Iowa State STRIPS team, strategically placed prairie strips (~10% of field converted to prairie) have the potential to reduce runoff by 44%, reduce P by 90%, reduce N by 84% and provide a reduction in soil loss by 95%. The strips will not reduce per acre yields and will provide habitat for wildlife, pollinators and potentially aid in monarch recovery efforts.

We are looking for more landowners interested in planting prairie strips on their farm! **Please contact Ashley Kittle at ashley.kittle@uni.edu to learn more.**



What County Engineers and Roadside Vegetation Managers Think About Integrated Roadside Vegetation Management

Kristine Nemec, *IRVM Program Manager*
- kristine.nemec@uni.edu

What motivates a county to practice integrated roadside vegetation management? How is it being implemented and what are the barriers and benefits to using IRVM? Those questions were asked of county engineers and roadside vegetation managers in a recent survey. IRVM consists of native plantings, reduced mowing, and selective herbicide use in the right-of-way. Having a county roadside manager and an IRVM plan on file with the Iowa DOT are also important. Because IRVM is voluntarily practiced by counties, understanding perceptions of IRVM helps those who promote IRVM better address county needs and inform non-participating counties about the program.

IRVM Program Manager Kristine Nemec collaborated with Mary Losch and Andrew Stephenson of the UNI Center for Social and Behavioral Research on the survey, which was funded by the Living Roadway Trust Fund. A steering committee composed of the Iowa Department of Transportation, Trees Forever, and Tallgrass Prairie Center provided input on survey questions. In March, all 99 county engineers and all 37 roadside managers received surveys; 64 county engineers (65%) and 34 roadside managers (92%) returned the questionnaires. The majority of both engineers and roadside managers agreed that IRVM maintains or improves water quality, enhances biodiversity, protects soil resources, promotes partnerships with other organizations, reduces spread of invasive species, and optimizes the effectiveness of weed and pest control practices. Engineers in counties with roadside managers were more likely to agree that IRVM provides attractive roadsides than engineers in counties without roadside managers. Both engineers and roadside managers identified similar challenges to implementing IRVM: the length of time native plants take to establish, interference from adjacent landowners who either spray or mow the plantings, and cost. For both groups, maintenance cost savings was the most influential factor in deciding how to implement roadside management strategies. However, roadside managers were more influenced by environmental stewardship, while engineers were more influenced by public input, surveys, and customer complaints.



Roadside managers, vendors, and roadside and prairie enthusiasts convened in Council Bluffs September 21-23 for the 30th annual roadside conference, hosted this year by Pottawattamie County roadside manager Dustin Ausdemore. Attendees enjoyed networking and learned about monarch conservation, proactive approaches to weed control, the Loess Hills, Indiana bat surveys, the importance of fire in prairie, the Story Map project - an online map of native roadside plantings, a range of roadside equipment and services, and updates from the Living Roadway Trust Fund and Integrated Roadside Vegetation Management program.



UNI Conservation Corps Community Rain Gardens Project

Eric Giddens, Prairie Energy Program Manager
- eric.giddens@uni.edu

In the spring of 2016, Tallgrass Prairie Center Prairie Energy Program Manager Eric Giddens took on a new responsibility with the Center for Energy and Environmental Education in coordinating a new initiative called UNI Conservation Corps. The goal of UNI Conservation Corps is to facilitate UNI faculty/staff and student engagement with community partners to do projects that implement science-based best practices to improve the environment. One of the first UNI Conservation Corps projects to be formed was a partnership between Maria Perez's Environment, Technology, and Society Capstone class, the Black Hawk Soil and Water Conservation District's Dry Run Creek Improvement Project led by Josh Balk, UNI's Landscape Architect, Laura Verden, and Eric Giddens from the Tallgrass Prairie Center to design and build rain gardens for three residences in Cedar Falls.

The central theme of Ms. Perez's Capstone class is current issues related to water, so this collaborative project fit perfectly into the goals of her course. Early in the Fall semester, the class of approximately 30 students learned about water quality issues and best practices that address those issues, they toured several urban storm water best practice projects both on and near the UNI campus, and then they learned how to

design residential rain gardens which promote infiltration of rooftop runoff. Rain gardens provide dual functions of reducing the quantity of water leaving the property as runoff during rainfall events and improving the quality of the water

as it is filtered by the soil and transpired by the native plants in the garden. Mr. Balk taught the class about the technical aspects of rain garden design and Ms. Verden taught them about native plant selection and landscaping considerations.

Mr. Balk identified three residences within the targeted impaired area of the Dry Run Creek Watershed who were eager to have Ms. Perez's class install rain gardens on their property. He coordinated the purchase of construction materials and plants and timing of the installation with the homeowners and then on the morning of



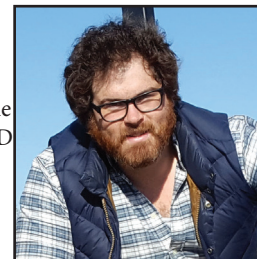
UNI students in Maria Perez's Environment, Technology, and Society Capstone class with one of three recently completed raingarden installations, under the supervision of Josh Balk, Dry Run Creek Watershed Coordinator (far right).

September 29, 2016, the students applied the knowledge that they obtained in the classroom by constructing beautiful rain gardens at the residences. This project was a win-win-win-win-win...for the UNI students who were involved, for the Dry Run Creek Improvement Project, for the homeowners who received beautiful rain gardens, for the budding UNI Conservation Corps initiative, and for the environment!



New Center Staff Profile

Justin Meissen, Research and Restoration Program Manager



Justin joined Center staff in July 2016 to lead the Research and Restoration Program. He has a PhD in Conservation Biology from the University of Minnesota and a BS in Integrative Biology from the University of Illinois at Urbana Champaign. Justin has worked professionally in restoration ecology and botany from North Carolina to California with The Nature Conservancy, The Audubon Society, and other non-profits and environmental contractors. Justin has spent much of his time working in tallgrass prairies in Illinois and Minnesota, and most recently finished his PhD which investigated the sustainability of wild seed harvest for restoration in native tallgrass prairies. He is also an avid nature photographer whose work can be found throughout the web.

SAVE THE DATE!

- November 29-30 Green Lands Blue Waters Conference, Columbia, MO
<http://snr.missouri.edu/green-lands-conference>
- January 24-26 Winterfest, Iowa Association of County Conservation Boards Waterloo, IA
- March 28-29 Iowa Invasive Species Conference, Honey Creek Resort State Park, Moravia, IA <http://www.iowainvasives.org>
- April 21-22 Iowa Academy of Science Annual Meeting, UNI Cedar Falls
- July 14-15 Iowa Prairie Conference "Prairie progress: Protection, restoration and reconstruction in the Central and Southern Loess Hills", Council Bluffs, IA
<http://www.goldenhillsrccd.org/prairie-conference.html>
- September 27-29 2017 IRVM Roadside Conference, Best Western Regency Inn, Marshalltown, IA



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NEWSLETTER

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Tallgrass Prairie Center, 2412 W 27th Street
University of Northern Iowa
Cedar Falls, Iowa 50614-0294

www.tallgrassprairiecenter.org